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No. VI.

OBSERVATORY CHAIR.

The Silver Medal *and* Twenty Guineas *were presented to Mr. J.* Sperring, *Duke Street, Bloomsbury, for his Observatory Chair; a Model of which has been placed in the Society's Repository.*

Sir, 18*th November*, 1839.

I venture to send you a model of another contrivance of mine. It is a chair for an observatory; there is one in use at the residence of George Bishop, Esq., South Villa, Regent's Park. It would answer the purpose for an artist, with the exception of putting the rack perpendicular, and would do away with steps and scaffolding which are used in general for larger paintings; it will also serve for a gout-chair, and will enable the person to move himself in any position, and to any part of the room, with greater ease without any assistance, and when turned down flat will form a complete bedstead; and in case of illness the person may raise or lower himself at pleasure. Should the Society consider the model worthy their attention, I shall be happy to attend and explain more minutely its use.

I am, Sir, &c. &c.

J. Sperring.

At Mr. Winsland's, Builder,
Duke Street, Bloomsbury.

A. Aikin, Esq.
Secretary, &c. &c.

South Villa, Inner Circle, Regent's Park,
19*th November*, 1839.

The observing chair, contrived by Mr. Sperring for my observatory, supplies the great desideratum of enabling an observer, with a large refracting telescope, to employ it in every position from the horizon to the zenith, with such convenience and comfort to himself as is compatible with the accomplishment of the most delicate work he may have to perform. Its motions are under the command of the observer himself, rendering the presence of an assistant unnecessary, and enabling him to make the requisite alterations in his position with the slightest possible interruption to his work.

George Bishop, F.S.A.

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59 St. Paul's Churchyard,
December 12, 1839.

Sir,

I am sorry I cannot have the pleasure of attending the Committee this evening. I therefore beg to certify that the observing chair you made for Mr. Bishop is the most perfect of the kind, and in every respect equal to all the claims of ease and comfort that any gentleman can require when observing with an equatoreal, and finished in a truly elegant and workmanlike manner.

I most sincerely wish that the Committee may feel so much merit is fully equal to a reward.

I am, &c. &c.
G. Dollond.

To Mr. Sperring.

To possess the means of placing the body in a position of perfect repose is an advantage of inestimable price to those who are engaged in making micrometric observations on double stars and other celestial objects; for, howsoever complete may be the provision for stability in the construction of the instrument, the restrained positions of the observer are only maintained by the tension of those muscles which are least accustomed to continued action; and the consequent agitation of his body produces an apparent tremulous motion of the object in the field of the telescope.

Mr. Sperring constructed this chair for the observatory at the residence of G. Bishop, Esq., that gentleman having previously explained to him the nature of the inconveniences to be obviated. By horizontal and vertical motions the chair may be placed in a position corresponding to the azimuth and altitude of the star to be observed, while, by a still more valuable part of the contrivance, the observer may place his eye close to, or at any required distance from, the eye-piece of the telescope, his head and whole frame being so completely supported as to allow him to relax every muscle.

This chair is adapted to a telescope mounted on a polar axis, and is therefore provided with every requisite motion; by which an observer, whilst seated in it, may raise or lower himself, may vary the position of the seat and the slope of the back so as to support himself in any required position, to whatsoever part of the heavens the telescope may be directed.

Fig. 1 is a view of the west side of the telescope and axis, the chair, and the carriage on which it is mounted. Fig. 2 is a top view of the chair and carriage. These are drawn on a scale $\frac{1}{60}$ of the original.

a a the telescope on the polar axis *b b*, which is placed parallel to the earth's axis; *c* the divided circle of declination, and *d* the circle for right-ascensional motion; *e* the lower support; *f* the upper support; and *g* a block on which the clock is placed for the purpose of communicating to the telescope, by means of a tangent-screw engaging the circle *d*, a quantity of motion in right ascension exactly equal to, and corresponding with, the earth's motion on its axis: the telescope thus following the object at such a rate as to cause it to remain apparently stationary in the field. These three supports are built on the earth independent of the observatory, and rise through the floor *h h* without touching it, the crevices being concealed by the carpeting of the floor; the carriage *i i* stands on four wheels, *j j*, so as to roll round the centre bolt *k*, placed under the centre, *l*, of the telescope, and follow the motion of the telescope. The carriage has a floor *m m*, through which the bolt *k* is passed into the centre block *n*. *o o*, the two side-rails of the carriage between which the chair is supported so as to be capable of moving from end to end; they are therefore arcs of circles described from the centre *l*, by which the chair, when moving, preserves its distance from the eye-piece of the telescope whilst accompanying its motion. Fig. 3 is a side view of the chair and part of one rail *o*, one-tenth of the real size; *p p*, the base of the chair, is a strong frame fitting easy between the rails *o o*, its curve being the same as that of the rails, and having curved brass bars or tongues, *q q*, throughout its whole length, firmly screwed at each side, as shewn in the cross-section of the rails, fig. 4; these enter the curved brass grooves *r r*, which are let into the inner sides of the two rails *o o*, from end to end: by these the chair is confined, and supported between the rails so as to be capable of sliding from end to end. Fig. 5 is an end view of a rail, shewing the groove *r*, and sliding-bar *q* separate; *s s* are two of the several ears by which the bars are screwed to the frame *p*: the dotted lines *r r*, in fig. 3, also shew the place of the brass groove. For the purpose of moving the chair up and down the curved rails *o o*, two pinions *t t* are mounted on one axis *u*, which passes through the chair base *p*. These travel on two curved racks *v*, which are let in flush with the top of the rails, and extend from end to end. Fig. 6 is a top view of part of a rail, shewing the rack *v* on it. In fig. 3 the rack *v* is shewn by dotted lines. The observer, whilst seated, pulls round the wheel *w* on the right hand side, which is secured on the same axis *u* with the two pinions, and thus moves himself along the rail: a ratchet, wheel, 20, fig. 4, and click, are placed on each side close to the pinions, by which the chair is retained at its place: *x*, fig. 3, is one of the clicks; both the clicks are mounted on one axis which passes through the base, so that one hand will lift both when the chair is to be lowered. A tooth projecting from this axis is acted on by a spring, as shewn at fig. 7, so as either to keep the clicks in action, or hold them quite up whilst the chair descends.

The seat and back of the chair are both made movable for the purpose of enabling the observer to adjust himself comfortably to the telescope at any part of the rail. The middle cross bar of the frame *p* is much thicker than the frame, and rises above it as at *y*, where the seat *z* and the back of the chair 1, 1, are hinged to it. To support the seat, an axis is passed across near the front of it, as at 2, having a pinion at each side of the seat, with clicks and ratchets 3. These pinions are moved by the hand-wheel 5 on the left side, and the seat is thus raised or lowered. In like manner the back may be raised or lowered by moving the wheel 6 on the right side, the pinions of which work in the two racks 7. The racks 7 for the back, though joined to those of the seat in two bows, 4, 7, are yet curved from their separate centres. These bows answer the purpose of arms to the chair. Fig. 8 shews the spring and tooth under the seat which keep those clicks in action, and fig. 9 shews a similar spring and tooth for the back clicks. The foot-board 8, fig. 3, is hung to the seat by two metal hooks 9, one hook being shewn separate. When observing stars near the pole, the seat of the chair is made the back, and the back the seat, because the polar axis *b* will not allow of the complete revolution of the carriage round its centre bolt; therefore, the foot-board 8, 9 is made to unhook; and, for the same reason, the head-board 10 is made to unhook, that they may change places. In this case the clicks *x* are not used; but a contrary one is made to act in a contrary ratchet 21, fig. 4. The head-board 10 is shewn a little detached in order that its hook may be seen. 11, 12, and 13, are the three cushions. The head-board may be the whole width, or made in halves as at 10 in fig. 2. There are four sockets furnished with binding screws, two being screwed to the seat and two to the back, as at 14, 14; these are to receive the standard 15, on which the table 16 is jointed, and placed level by the binding screw 17; 18 is a drawer made to slide out either way. A hook standard 19, on which a lamp may be hung, is clamped to the table.

In this chair an observer can follow the telescope in every direction, and shape the chair to the most comfortable form, so as to support and adjust his head with the greatest nicety to the telescope.

The clock which moves the telescope is governed by a fly instead of a balance or pendulum, because a continuous motion is required; and it is connected with the tangent-screw by a clutch which is made to slide in or out of contact; the observer, while in his seat, being enabled to turn the tangent-screw by means of a long-handled key, and thus gradually move the telescope without the clock.

The dome of the observatory stands on a circular frame of rollers on the wall, and has a series of iron pins projecting inwards to serve as a rack. A lever hanging on a pin in the wall will always engage any one of the rack pins that may be over it, and so move the dome till its opening is brought to the right place. The opening is covered by a shutter made to slide, one way to open and the other way to shut, by means of cords passing over two pulleys.

No. VII.

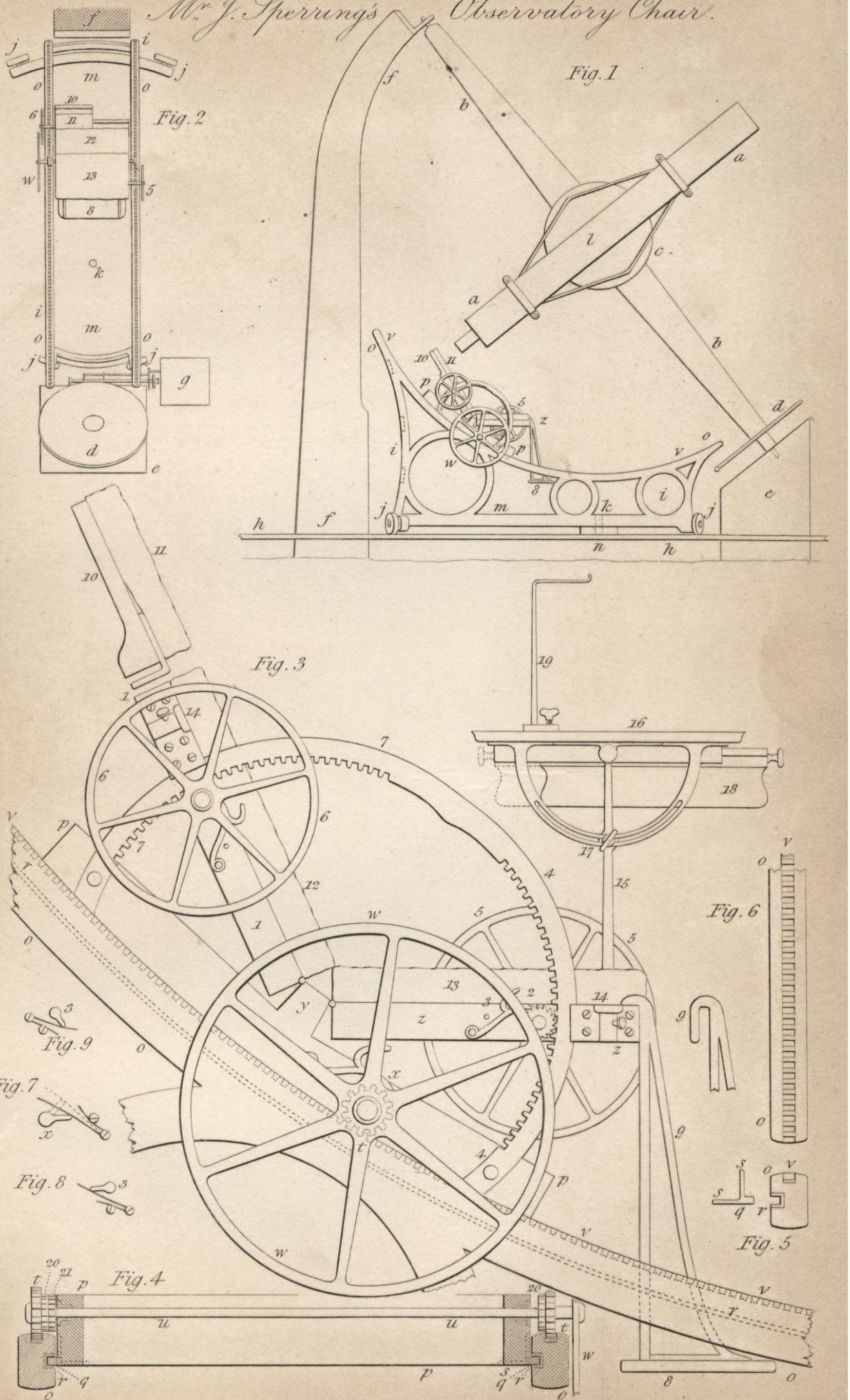
SETTER FOR A CARRIAGE.

The Sum of FIVE POUNDS was presented to Mr. JAMES HOPKINS, Globe Brewery, King's Road, Horsley Down, for his CARRIAGE SETTER; a Model of which has been placed in the Society's Repository.

Globe Brewery, King's Row, Horsley Down,
SIR, *9th November,* 1839.

I HAVE invented a very great improvement on *Carriage Setters*, and thinking the Society would notice it, I have been induced to send you a model of it for their kind in-

Mr. J. Sperring's Observatory Chair.



Drawn by C. Varley.

Engraved by G. Gladwin.